


Following error codes are valid for air heater models: 2000A, 2200A, 4000A, 5000A


		AIR HEATER FAULT CODES	
Rotary Controller (Number of flashes)	Digital Timer Controller (Hex value)	Error Description	Troubleshooting Steps
No Flashes	00	No Connection	1. Make sure the power supply is connected directly to the heater. 2. Make sure the operating temperature is not below 35 degrees Celcius. 3. Make sure the connection between the controller and the harness is secured. 4. Make sure the wires on the controller is secured.
1	10	Startup Failed under normal mode	1. Make sure nothing is clogged in the air inlet and outlet pipes. 2. Make sure there is sufficient fuel in the fuel tank. 3. Make sure the fuel line is not clogged. 4. Check the fuel level, make sure there is sufficient fuel in the tank.
	12	Startup Failed under increased oxygen mode	5. Check the resistance value of the glow pin under normal temperature. (Normal resistance value: 12V: 0.1 - 0.2 Ohms; 24V: 0.7 - 1.2 Ohms) 6. Clean all carbon deposits within the heater. 7. Replace the ECU
2	20	Flameout under normal mode	1. Make sure there are no air bubbles in the fuel line. 2. Check the fuel pump to ensure proper fuel output. 3. Check the resistance value of the glow pin under normal temperature. (Normal resistance value: 12V: 0.1 - 0.2 Ohms; 24V: 0.7 - 1.2 Ohms)
	24	Flameout under increased oxygen mode	4. Clean all carbon deposits within the heater. 5. Replace the burner.
3	30	Voltage too high	1. Measure the supply voltage. Normal operating voltage: 12V unit: 10.5V - 16V 24V unit: 21.5V - 30V
	31	Voltage too low	2. Charge the battery to the normal operating voltage. 3. Make sure the connection between the harness and the battery is secured.
4	40	There is flame at the self-inspection stage	1. Turn off the heater and wait for it to cooldown. 2. Restart the heater
	41	Furnace temperature too high before ignition	1. Use ventilation mode to cooldown the heater.
	42	Furnace overheated	2. Check temperature sensor resistance value (1.1k Ohms under normal temperature). 3. If sensor is OK, replace the ECU
5	50	Flame sensor open circuit	1. Test sensor circuit continuity 2. Replace the flame sensor 3. If sensor is OK, replace the ECU
	51	Flame sesnsor short circuit	1. Check sensor circuit, look for frayed wires 2. If sensor is OK, replace the flame sensor/ECU
	52	Supply temperature sensor open circuit	1. Test sensor circuit continuity 2. Replace the supply temperature sensor 3. If sensor is OK, replace the ECU
	53	Supply temperature sensor short circuit	1. Check sensor circuit, look for frayed wires 2. If sensor is OK, replace the flame sensor/ECU

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6	65	Inlet temperature sensor open circuit	1. Test sensor circuit continuity 2. Replace the supply temperature sensor 3. If sensor is OK, replace the ECU
	66	Inlet temperature sensor short circuit	1. Check sensor circuit, look for frayed wires 2. If sensor is OK, replace the flame sensor/ECU
	67	Air intake temperature too high	1. Check if outlet air is going back to the inlet 2. Power off and wait for the heater to cooldown 3. Restart the heater
	68	External temperature sensor open circuit	1. Test sensor circuit continuity 2. Replace the supply temperature sensor 3. If sensor is OK, replace the ECU
	69	External temperature sensor short circuit	1. Check sensor circuit, look for frayed wires 2. If sensor is OK, replace the flame sensor/ECU
7	70	Fuel pump open circuit	1. Make sure the pin connections of the fuel pump is in good condition. 2. Make sure the connection between the harness and the fuel pump is secured.
	71	Fuel pump short circuit	3. If connection is secure, replace the fuel pump 4. If fuel pump is OK, replace the ECU
8	80	Blower motor is open circuit	1. Test blower motor and circuit continuity 2. If circuit is OK, replace blower motor 3. If blower motor is OK, replace the ECU
	81	Blower motor is short circuit	1. Check blower circuit, look for frayed wires 2. If circuit is OK, replace the blower 3. If blower is OK, replace the ECU
	82	Blower motor fan speed is too slow	1. Voltage drops, check power source and wiring 2. Check ducting 3. If all checked out, replace the ECU
	83	Blower motor fan speed is too fast	1. Abnormal voltage, check power source and wiring 2. Check ducting 3. If all checked out, replace the ECU
	84	Blower motor fan speed measurement failure	1. Check process air impeller for damage and position 2. If impeller is OK, replace the ECU
9	85	Blower motor fan failed to start	1. Check fuses and wiring 2. Check to see if the fan is stuck 3. Replace the blower
	90	Glow pin open circuit	1. Make sure battery voltage is within normal operating range. Normal operating voltage:
	91	Glow pin short circuit	12V unit: 10.5V - 16V 24V unit: 21.5V - 30V
	92	Wrong type of glow pin/Broken glow pin	2. Check the resistance value of the glow pin under normal temperature. (Normal resistance value: 12V: 0.1 - 0.2 Ohms; 24V: 0.7 - 1.2 Ohms)
10	93	Glow pin driver circuit open circuit	3. Clean all carbon deposits on the glow pin. 4. Replace the ECU
	A2	Furnance temperature too high during heating	1. Make sure air inlet temperature is less than 35 degrees Celcius 2. Make sure all covers have been locked into place.
	A4	Inlet air temperature too high before ignition	3. Make sure air inlet and outlet is not blocked 4. Make sure hot air from the outlet does not re-enter the air inlet.
	A9	Abnormal power loss	1. Check power supply 2. Replace the ECU



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11	B4	Furnance temperature sensor open circuit	1. Make sure pins on the sensor are in good condition. 2. Replace the temperature sensor if resistance value of the sensor is abnormal. (Normal resistance of temperature sensor is 1.1k Ohms under normal temperature.)
	B5	Furnance temperature sensor short circuit	3. Replace the ECU
	C0	Vehicle heater open circuit	1. Check vehicle's electrical wirings.
	C1	Vehicle heater short circuit	
	C4	Controller open circuit	1. Replace the controller
	C5	Controller short circuit	
	D0	ECU failure	1. Replace the ECU
	D1	Failed to save information	1. Replace the ECU
	D3	Maintenance warning	1. Conduct maintenance (clean combustion chamber, replace burner and other wearables)
	E0	Cannot detect ignition signal	1. Replace the ECU
	E1	No power at glow pin driver	1. Replace the ECU
	E2	Glow pin monitoring failed	1. Replace the ECU
E3	No signal detected from the flame sensor	1. Make sure flame sensor is plugged in properly 2. Replace flame sensor 3. Replace the ECU	
EE	Unknown fault	1. Replace the ECU	

Updated On:	February 18, 2022
Item	Value
Supply Voltage	12V: 10.5V - 16V 24V: 21.5V - 30V
Glow pin	12V: 0.1 - 0.2 Ohms 24V: 0.7 - 1.2 Ohms
Temperature sensor	1.1k Ohms

Following error codes are valid for coolant heater models: 5000C, 9000C



COOLANT HEATER FAULT CODES

Digital Timer Controller (Hex)	Error Description	Troubleshooting Steps
00	No Connection	1. Make sure the power supply is connected directly to the heater. 2. Make sure the operating temperature is not below 35 degrees Celcius. 3. Make sure the connection between the controller and the harness is secured. 4. Make sure the wires on the controller is secured.
10	Volatge too high	1. Check power supply and connections
11	Volate too low	1. Check power supply and connections 2. Charge the battery
13	Second Failure	1. Make sure there is sufficient fuel in the fuel tank 2. Make sure the fuel line is not clogged. 3. Make sure air intake and exhaust are not blocked. 4. Make sure fuel level is appropriate.
12	Coolant overheat, exceeding software limit	1. Check coolant level 2. Refill coolant after temperature cooled down 3. Check if the coolant pump is working.
14	Coolant temperature too high/Temperature difference too much	
15	Overheat lock 10 times	
17	Coolant overheat, exceeding hardware limit	
20	Glow pin open circuit	1. Clean up carbon deposit on the glow pin 2. Replace glow pin
21	Glow pin short circuit	3. Replace ECU
22	Wrong type of glow pin/glow pin performance lost	1. Make sure the right glow pin is installed 2. Replace glow pin
30	Fan speed too fast	1. Replace ECU
31	Fan circuit is open	1. Check if the blower fan is mounted properly 2. Replace blower motor assembly 3. Replace ECU
32	Fan circuit is shorted	1. Check blower circuit, look for frayed wires 2. If circuit is OK, replace the blower 3. If the blower is OK, replace the ECU
33	Fan speed too slow	1. Make sure power voltage is sufficient 2. Check if the blower fan is mounted properly 3. Replace ECU
38	Warm air blower is short circuit	1. Check fuses/wiring
39	Warm air blower is open circuit	1. Check fuses/wiring
41	Coolant pump open circuit	1. Check coolant pump line
42	Coolant pump short circuit	2. Replace coolant pump
45	Fuel heater short circuit	1. Check fuses/wiring
46	Fuel heater open circuit	1. Check fuses/wiring
47	Fuel pump short circuit	1. Make sure connections between the ECU and fuel pump is connected properly. 2. Replace fuel pump 3. Replace ECU
48	Fuel pump open circuit	
50	Start failure lock, start failed more than 10 times	1. Make sure there is sufficient fuel in the fuel tank 2. Make sure the fuel line is not clogged. 3. Make sure air intake and exhaust are not blocked. 4. Make sure fuel level is appropriate.
51	Flame sensor temperature too hot during startup	1. Ventilate and cooldown the flame sensor 2. Check flame sensor resistance value. (Normal resistance value is 0.8k Ohms)
52	Flameout 3 times	1. Make sure there is sufficient fuel in the fuel tank 2. Make sure the fuel line is not clogged. 3. Make sure air intake and exhaust are not blocked. 4. Make sure fuel level is appropriate.
55	Flame detected before ignition	1. Ventilate and cooldown the flame sensor 2. Check flame sensor resistance value. (Normal resistance value is around 0.8k Ohms)
60	Temperature sensor open circuit	1. Check temperature sensor resistance value. (Normal resistance value is around 10k Ohms.) 2. Replace temperature sensor
61	Temperature sensor short circuit	

Following error codes are valid for coolant heater models: 5000C, 9000C



COOLANT HEATER FAULT CODES

Digital Timer Controller (Hex)	Error Description	Troubleshooting Steps
62	Coolant temperature too high before ignition	1. Cooldown coolant 2. Check temperature sensor resistance value. (Normal resistance value is around 10k Ohms.) 3. Replace temperature sensor
64	Flame sensor open circuit	1. Check flame sensor resistance value. (Normal resistance value is around 0.8k Ohms)
65	Flame sensor short circuit	2. Replace flame sensor
71	Overheat sensor open circuit	1. Check overheat sensor. (Power off protection switch)
72	Overheat sensor short circuit	2. Replace overheat sensor.
84	Blower motor fan speed monitoring failed	1. Check process air impeller for damage and position 2. If impeller is OK, replace the ECU
85	Blower fan failed to start	1. Check fuses and wiring 2. Check to see if the fan is stuck
86	Circulation fan short circuited	1. Check fuses/wiring
91	ECU Controller Failure	1. Check heater and timer connections 2. Ensure sufficient voltage is applied
99	Failed to save information	1. Replace the ECU
A9	Abnormal power loss	1. Check power supply 2. Replace the ECU
AA	Unknown glow pin test error	1. Replace glow pin 2. Replace the ECU
AB	Unknown blower motor test error	1. Replace blower motor assembly 2. Replace the ECU
AC	Unknown voltage test error	1. Check supply voltage 2. Check fuses/wiring 3. Replace the ECU
AD	Unknown fuel pump test error	1. Make sure connections between the ECU and fuel pump is connected properly. 2. Make sure fuel line is not clogged 3. Replace fuel pump 4. Replace the ECU
AE	Unknown fuel pump failure	1. Replace fuel pump 2. Replace the ECU
AF	Unknown temperature sensor failure	1. Replace temperature sensor 2. Replace the ECU
B0	Communication failure	1. Ensure all connections to and from the ECU 2. Replace the ECU
D3	Maintenance warning	1. Clean up carbon deposits and replace consumables.
E0	Ignition signal not detected	1. Check fuses/wiring 2. Replace the ECU
E1	Glow pin driver voltage not detected	1. Check the installation of the glow pin 2. Check fuses/wiring 3. Replace the ECU
E2	Glow pin monitoring circuit failure	1. Check fuses/wiring 2. Replace the ECU
E3	Flame sensor signal not detected	1. Check flame sensor resistance value. (Normal resistance value is around 0.8k Ohms) 2. Replace flame sensor 3. Replace the ECU
EE	Unknown error	1. Replace the ECU

Updated On:	2022-02-18
Item	Value
Flame Sensor	0.8k Ohms
Temperature Sensor	10k Ohms